DOCUMENT RESUME

ED 091 228 SE 017 809

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TITLE Status Study of Competency Based Teacher Education Programs in Science.
PUB DATE 15 Mar 74
NOTE 36p.; Paper presented at the Annual Meeting of the Association for the Education of Teachers in Science (Chicago, Illinois, March 1974)

EDRS PRICE MF-$0.75 HC-$1.85 PLUS POSTAGE
DESCRIPTORS *Educational Research; *Performance Based Teacher Education; *Preservice Education; Research; *Science Education; State of the Art Reviews; Surveys; *Teacher Education
IDENTIFIERS Research Reports

ABSTRACT

The results of a survey of 53 members of the Association for the Education of Teachers in Science and of 76 institutions having some form of competency based teacher education (CBTE) program are tabulated in this document. The report is divided into two sections, one pertaining to CBTE programs in general and the other relating specifically to science education. Among the 10 conclusions that the author lists are that relatively few students are being prepared in CBTE programs in relation to the total number of teachers in training throughout the United States, that most CBTE programs are field-based, and that some sort of pre-student teaching practicum experience was almost universally reported. Frequently mentioned problems identified in CBTE efforts are specified. The survey instrument is included in the appendix. (DT)

TO: CBTE Survey Respondents

FROM: Don McCurdy
211 Henzlik Hall
University of Nebraska at Lincoln
Lincoln, Nebraska 68508
(Member of the Association for the Education of Teachers
in Science Study Committee on CBTE programs)

Please find enclosed the results of the recent survey of competency based teacher education programs conducted by AETS. Hopefully, this data will give you some gross indications of the directions that CBTE is taking in the U.S. today.

Your cooperation in promptly returning our questionnaire is sincerely appreciated. Thank you.

STATUS STUDY OF COMPETENCY BASED TEACHER EDUCATION PROGRAMS IN SCIENCE

by
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Associate Professor of Secondary Education
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A Paper Presented To The
Association for the Education of Teachers in Science
Annual Meeting, March 15, 1974, Chicago

STATUS STUDY OF COMPETENCY BASED TEACHER EDUCATION PROGRAMS IN SCIENCE

Introduction:

During the Spring of 1973 an ad hoc committee of the Association for the Education of Teachers in Science (AETS), under the leadership of Dr. Victor Morris was commissioned to make a study of competency based teacher education in science and to be prepared to report the results along with recommendations to the 1974 convention. A portion of this commission involved an attempt to determine the "state of the art". It was necessary to determine the extent of involvement in CBTE and the nature of that involvement by members of the association and others.

In order to accomplish this task, the author of this report consulted with his colleagues to ascertain the nature of the information that might be useful to AETS members and others as they consider competency based teacher education.

A survey instrument (Appendix "A") was prepared, tested on a selected group of colleagues, and subsequently revised. The revised instrument was mailed to two groups--the sixty-nine names on the 1973-1974 AETS Directory and to a list of 131 institutions supplied by the American Association of Colleges of Teacher Education (AACTE) who were recognized by that organization as having implemented some form of CBTE program.

A separate letter was written to the names on these two lists (in some cases there were no names on the AACTE lists and letters were thus written to deans or departmental chairmen). Copies of these letters are found in Appendices "B" and "C". A copy of the survey instrument together with a self-addressed prepaid envelope were enclosed with each letter. No follow-up was attempted.

The instructions for the questionnaire provided a definition for competency based teacher education as follows: "We define competency based programs as having a defined set of competencies or behavioral outcomes which have a range beyond a single course within the given institution. Performance goals are specified and agree to in rigorous detail in advance of instruction. The student preparing to become a teacher must either be able to demonstrate his ability to promote desirable learning or exhibit behavior known to promote it. He is held accountable, not for passing grades but for attaining a given level of competency in performing the essential tasks of teaching."[1] Respondents were asked to write "no competency based program" on the face of the questionnaire or letter and return it if their program did not correspond to this definition.

Fifty-three of the 69 AETS members (76.8%) responded to the survey. Of this group 25 or 47.7% of the respondents filled out the questionnaire. The remainder indicated they were not operating CBTE programs as defined.

Seventy-six of the 131 institutions (57%) identified by AACTE responded to the letter. Fifty of this group or 66% indicated that

[1]Stanley Elam. Performance-Based Teacher Education: What is the State of the Art? PBTE Series: No. 1. Washington, D.C.: American Association of Colleges for Teacher Education, 1971.

they were operating competency based programs as defined by the questionnaire.

Responses to the various items were coded on punch cards and tabulated through the use of an SPSS Computer program. The results are displayed in this report in the form of a series of tables. Results were tabulated for two groups--AETS members and programs reported by AACTE. In a few cases where an AETS member was reporting for an institution named by AACTE, the results were tabulated under the AETS category. Thus it is possible to compare responses of the AETS membership with those of a broader spectrum of respondents representing CBTE programs throughout the nation.

Since nearly 50% (47.7%) of the AETS respondents reported operating a CBTE program at their respective institutions, it would appear that CBTE has established a firm foothold in the colleges and universities represented by this group. It would thus seem a worthy undertaking to analyze the nature of the programs in these institutions to determine if there exist any patterns of direction and to take advantage of any guidance which might be inherent in such an analysis.

Institutions were requested to supply lists of competency statements and/or examples of instructional materials. Nineteen of the 75 respondents furnished such materials.

The information in this report has been summarized as follows: The question as it appeared in the questionnaire is restated. Immediately following the question, the data, generally in the form of numbers of respondents and percent of the respondent group, are

presented in table form. The data have been identified as representing the AETS membership group, the AACTE group and combined figures. The report is also divided into two sections--that pertaining to CBTE programs in general and that relating specifically to science education.

GENERAL INFORMATION SECTION

1. What segment(s) of the training of teachers is included in your competency based program?

   a. Professional Component
   b. General Education Component
   c. Subject Matter Component
   d. In-Service Component
   e. Other (describe)

TABLE I
SEGMENTS OF TRAINING OF TEACHERS
INCLUDED IN CBTE PROGRAM

	AETS		AACTE		ALL	
	N	%	N	%	N	%
Professional	22	88%	46	92%	68	90.7%
General Education	6	24%	5	10%	11	14.7%
Subject Matter	3	12%	8	16%	11	14.7%
In-Service	4	16%	19	38%	23	30.7%
Other	3	12%	4	8%	7	9.3%

2. Of the professional component, which of the following areas are included?

   a. History and/or Philosophy
   b. Educational Psychology
   c. General Methods
   d. Student Teaching
   e. Special Methods
   f. Other

TABLE II
PROFESSIONAL COMPONENT INCLUDED
IN CBTE PROGRAM

	AETS		AACTE		ALL	
	N	%	N	%	N	%
History and Philosophy	11	46%	17	34%	28	37.3%
Educational Psychology	16	64%	35	70%	51	68.0%
General Methods	16	64%	35	70%	51	68.0%
Student Teaching	17	68%	37	74%	54	72.0%
Special Methods	19	76%	35	70%	54	72.0%

3. What term best describes your institution?

a. University
b. State College
c. Liberal Arts College
d. Other

TABLE III
TYPES OF INSTITUTIONS
EMPLOYING CBTE

	AETS		AACTE		ALL	
	N	%	N	%	N	%
University	21	84	34	68	55	73.3
State College	2	8	11	22	13	17.3
Liberal Arts	0	0	4	8	4	5.3
Other	2	8	1	2	3	4.0

4. How many students per semester are involved in your competency based program?

a. Less than 50
b. 51-100
c. 101-150
d. 151-200
e. 201-250
f. 251-300
g. 300 and up

TABLE IV
NUMBERS OF STUDENTS PER SEMESTER
INVOLVED IN COMPETENCY BASED PROGRAM

	AETS		AACTE		ALL	
	N	%	N	%	N	%
Less than 50	7	28	17	34	24	32.0
51-100	6	24	4	8	10	13.3
101-150	5	20	9	18	14	18.7
151-200	4	16	2	4	6	8.0
201-250			6	12	6	8.0
251-300	2	8	10	20	12	16.0
300 and up			2	4	2	2.7

5. In terms of full-time equivalents, what is your student/faculty ratio?

a. 10-14/1
b. 15-20/1
c. 21-25/1
d. 31-35/1

TABLE V
STUDENT-FACULTY RATIO
IN FULL-TIME EQUIVAIENTS

	AETS		AACTE		ALL	
	N	%	N	%	N	%
10-14/1	7	28	5	10	12	16
15-20/1	9	36	24	48	33	44
21-25/1	4	16	10	20	14	18.7
31-35/1	3	12	5	10	8	10.7

6. Approximately what proportion of your teacher education students are involved in the competency based program?

a. less than 10%
b. 10-19%
c. 20-29%
d. 30-39%
e. 40-49%
f. 50-59%
g. 70-79%
h. 80-89%
i. 90-99%

TABLE VI
PROPORTION OF STUDENTS
INVOLVED IN CBTE

	AETS		AACTE		ALL	
	N	%	N	%	N	%
Less than 10%	2	8	11	22	13	17.3
10-19%	3	12	9	18	12	16.0
20-29%	2	8	2	4	4	5.3
30-39%	0	0	2	4	2	2.7
40-49%	1	4	0	0	1	1.3
50-59%	3	12	4	8	7	9.3
60-69%	0	0	0	0	0	0
70-79%	2	8	2	4	4	5.3
80-89%	2	8	0	0	2	2.7
90-99%	9	36	20	40	29	38.7

7. Approximately what proportion (in terms of course work) of your entire teacher education program (professional, general and subject matter specialization) is included in the competency based program?

TABLE VII
PERCENT OF TEACHER EDUCATION
PROGRAM INCLUDED IN CBTE

	AETS		AACTE		ALL	
	N	%	N	%	N	%
Less than 10%	1	4	9	18	10	13.3
10-19%	11	44	9	18	20	26.7
20-29%	4	16	13	26	17	22.7
30-39%	1	4	5	10	6	8.0
40-49%	1	4	1	2	2	2.7
50-59%	1	4	4	8	5	6.7
60-69%			2	4	2	2.7
70-79%	1	4	2	4	3	4.0
80-89%	1	4	0	0	1	1.3
90-99%	4	10	5	10	9	12.0

8. Which of the following agencies or groups are actively involved in your competency based program? Briefly describe the nature of this involvement in the space provided.

TABLE VIII

AGENCIES OF GROUPS ACTIVELY
INVOLVED IN CBTE PROGRAM

	AETS		AACTE		ALL	
	N	%	N	%	N	%
Educational Departments	24	96	47	94	71	94.7
Arts & Science Depts.	5	20	14	28	19	25.3
Public Schools	20	80	42	84	62	82.7
State Dept.	10	40	23	46	33	44.0
Professonal Organizations	7	28	17	34	24	32.0

9. Which of the following organizations or groups are involved in the control (decision making) of the program?

TABLE IX
ORGANIZATIONS OR GROUPS INVOLVED
IN CONTROL OF CBTE PROGRAM

	AETS		AACTE		ALL	
	N	%	N	%	N	%
Educational Departments	22	88	48	96	70	93.3
Arts & Science Depts.	7	28	12	24	19	25.3
Public Schools	16	64	27	54	43	57.3
State Dept.	7	28	17	34	24	32.0
Professional Organizations	5	20	12	24	17	22.7
Students	12	48	24	48	36	48.0

10. Have courses within your program been merged or does your program operate within the context of formerly existing courses?

TABLE X
ORGANIZATION OF PROGRAM
AS MERGED OR SEPARATE
COURSES

	AETS		AACTE		ALL	
	N	%	N	%	N	%
Merged Courses	15	60	24	48	39	52.0
Separate Courses	8	32	19	38	27	36.0

11. Does your program utilize a modular approach to instruction?

TABLE XI
NUMBER AND PERCENT OF INSTITUTIONS
REPORTING MODULAR APPROACH TO INSTRUCTION

	N	%
AETS	20	80
AACTE	43	86
ALL	63	84

12. Does your program utilize a norm-referenced or criterion referenced evaluation of student performance?

TABLE XII
NATURE OF STUDENT EVALUATION

	AETS		AACTE		ALL	
	N	%	N	%	N	%
Norm Referenced	3	12	3	6	6	8.0
Criterion Referenced	20	80	42	92	66	88.0

13. How do you measure competency attainment?

TABLE XIII
PROCEDURES FOR MEASURING
COMPETENCY ATTAINMENT

	AETS		AACTE		ALL	
	N	%	N	%	N	%
Microteaching	17	68	43	86	60	80.0
Paper & Pencil Tests	17	68	47	94	64	85.3
Pre-Student Teaching	19	76	37	74	56	74.7
Student Teaching	20	80	39	78	59	78.7
Student-Faculty Conference	16	64	43	68	59	78.7

14. What types of interactions occur between the public schools and the teacher-training institution?

TABLE XIV
TYPES OF INTERACTIONS OCCURRING
BETWEEN PUBLIC SCHOOLS AND
TEACHER TRAINING INSTITUTION

	AETS		AACTE		ALL	
	N	%	N	%	N	%
Advisory Committees	21	84	36	72	57	76.0
Board of Directors	5	20	12	24	17	22.7
Curriculum Committee	10	40	24	48	34	45.3
Joint Appointments	9	36	19	38	28	37.3
Other						

15. Does your competency based program involve a pre-student teaching practicum experience?

TABLE XV
NUMBER AND PERCENT OF
INSTITUTIONS PROVIDING PRE-
STUDENT TEACHING PRACTICUM

	N	%
AETS	22	88.0
AACTE	41	82.0
ALL	63	84.0

16. At what level(s) does this experience take place?

TABLE XVI
LEVELS OF PRE-STUDENT TEACHING
PRACTICUM EXPERIENCE

	AETS		AACTE		ALL	
	N	%	N	%	N	%
Freshman	4	16	4	12	10	13.3
Sophomore	8	32	12	24	20	26.7
Junior	19	76	35	70	54	72.0
Senior	15	60	26	52	41	54.7

17. Approximately how many hours/week are involved?

TABLE XVII
HOURS PER WEEK INVOLVED
IN PRE-STUDENT TEACHING
PRACTICUM

	AETS		AACTE		ALL	
	N	%	N	%	N	%
Less than 5 hrs/week	6	24	15	30	21	28.0
5-10 hours/week	11	44	14	28	25	33.3
10-15 hours/week	3	12	2	4	5	6.7
More than 15 hrs./week	2	8	8	16	10	13.3

18. Are competencies stated in terms of behavioral outcomes?

TABLE XVIII
NUMBER AND PERCENT OF INSTITUTIONS
REPORTING COMPETENCIES STATED
AS BEHAVIORAL OUTCOMES

	N	%
AETS	22	88
AACTE	48	96
ALL	70	93.3

19. What characteristics of a competency based program is the project based on?

TABLE XIX
NUMBER AND PERCENT OF INSTITUTIONS
REPORTING VARIOUS CHARACTERISTICS
OF COMPETENCY BASED PROGRAMS

	AETS		AACTE		ALL	
	N	%	N	%	N	%
Competencies Stated as Behavioral objectives	18	72	42	84	60	80.0
Instructional Strategies Planned in Terms of Specified Terminal Competencies	17	68	39	78	56	74.7
Evaluation Consistent With Both Identified Competencies And Instructional Strategies	20	80	43	86	63	84.0
Competency Statements Shared With Students	17	68	46	92	63	84.0
Focus on the Learner as Being Responsible for Acquiring Competencies	17	68	40	80	57	76.0

SCIENCE EDUCATION SECTION

20. What kind of cooperative input exists between science and education faculty?

TABLE XX
NATURE OF COOPERATION
BETWEEN SCIENCE AND EDUCATION
FACULTIES

	AETS		AACTE		ALL	
	N	%	N	%	N	%
Cooperative Discussions To Identify Competencies	10	40	16	32	26	34.7
Providing Practicum Experiences	2	8	15	30	17	22.7
Integration of Subject Matter Competencies with Methodological and Psychological Competencies	8	32	13	26	21	28.0
Providing Learning Experiences for Achieving Competencies	6	24	15	30	21	28.0
Little or no Cooperation	7	28	18	36	25	33.3

21. What are the sources of the science teacher competencies?

TABLE XXI
NUMBER AND PERCENT OF REPORTED
SOURCES OF SCIENCE TEACHER
COMPETENCIES

	AETS		AACTE		ALL	
	N	%	N	%	N	%
Science Education Staff	23	92	35	70	58	77.3
Science Staff	8	32	11	22	19	25.3
Public School Staff	15	60	21	42	36	48.9

22. Below are listed categories of science teacher competencies. Please place a check mark to the left of any which are included in your program and rank them 1,2, or 3 in terms of how important you perceive them to be. (1=essential, 2=very important, but not essential, 3=marginal in importance or not important).

TABLE XXII
MEAN VALUES* ASSIGNED TO CATEGORIES OF
SCIENCE TEACHER COMPETENCIES

		AETS	ACCTE	ALL	RANK
1.	Ability to write behavioral objectives in science	1.66	1.45	1.40	7
2.	Questioning skills	1.24	1.23	1.24	2
3.	Tutoring skills=	1.95	1.68	1.79	17
4.	Set (motivation) and closure skills	1.56	1.52	1.53	9
5.	Behavior modification skills	1.84	1.71	1.77	16
6.	Testing and evaluation skills	1.41	1.33	1.37	6
7.	Audio-visual skills	1.75	1.74	1.74	15
8.	Small group leadership	1.32	1.85	1.61	12
9.	Ability to select content and materials in science	1.19	1.27	1.24	2
10.	Knowledge and understanding of National Curriculum Projects	1.81	1.87	1.85	19
11.	Ability to do longrange (unit) planning in science	1.46	1.59	1.53	9
12.	Ability to individualize instruction in science	1.50	1.27	1.36	5
13.	Ability to provide for safety in the classroom and lab	1.55	1.54	1.54	11
14.	Ability to use the inquiry method	1.35	1.21	1.26	4
15.	Ability to design and organize facilities for science teaching	2.05	1.63	1.81	18
16.	Ability to requisition science supplies and equipment	2.15	2.04	2.09	21
17.	Ability to conduct effective demonstrations	1.90	1.55	1.70	14
18.	Ability to improvise equipment and facilities	1.79	1.61	1.68	13
19.	Ability to conduct field experiences and utilize community resources	1.52	1.52	1.52	8
20.	Ability to plan, conduct, and evaluate laboratory experiences	1.10	1.37	1.16	1
21.	Ability to plan, conduct, and evaluate extracurricular activities in science	1.95	1.88	1.91	20

*Note - Values were assigned according to the following legend: 1=Essential, 2= Very important, but not essential, 3=Marginal in importance or not important. Thus the lower the mean rank, the greater the assigned importance.

23. How are the science education competencies presented?

a. as separate skills
b. integrated with skills in the use of learning theory
c. integrated with subject matter competencies
d. a combination of the above

TABLE XXIII
NUMBER AND PERCENT OF INSTITUTIONS
REPORTING VARIOUS PATTERNS FOR
PRESENTING SCIENCE EDUCATION
COMPETENCIES

	AETS		AACTE		ALL	
	N	%	N	%	N	%
As Separate Skills	4	16	11	22	15	20.0
Integrated with Skills in the Use of Learning Theory	10	40	17	34	27	36.0
Integrated with Subject Matter Competencies	6	24	11	22	17	22.7
Combination of the Above	12	56	26	52	40	53.3

24. Which of the following practicum opportunities are provided?

a. tutoring
b. leading small groups
c. setting up labs
d. clerical duties
e. lecturing
f. leading discussion (pre-lab)
g. leading discussions (post-lab)
h. preparing and using A.V. materials
i. Other

TABLE XXIV
NUMBER AND PERCENT OF INSTITUTIONS REPORTING VARIOUS TYPES OF PRACTICUM EXPERIENCES

	AETS		AACTE		ALL	
	N	%	N	%	N	%
Tutoring	19	76	32	64	51	68.0
Leading small groups	22	88	34	68	56	74.7
Setting up labs	17	68	26	52	43	57.3
Clerical duties	13	52	16	32	29	38.7
Lecturing	11	44	22	44	33	57.3
Leading pre-lab discussions	18	72	25	50	43	57.3
Leading post-lab discussions	16	64	24	48	40	53.3
Preparing and using A.V. materials	18	72	31	62	49	65.4
Other	3	12	9	18	12	16.0

25. Approximately what percentage of the university or college faculty are themselves competent at this time in developing and implementing CBTE programs?

Professional Education faculty ___%
Subject Matter faculty ___%

TABLE XXV
MEAN PERCENTAGE OF UNIVERSITY OR COLLEGE FACULTY PERCEIVED AS COMPETENT IN DEVELOPING AND IMPLEMENTING CBTE

	Prof. Ed. Faculty	Subject Area Faculty
AETS	55.47	13.82
AACTE	48.36	16.23
ALL	50.64	15.42

26. What percentage of the university or college faculty are philosophically: (please estimate)

	Prof.ed. fac.	Sub. mat.
a. committed to the CBTE approach	___%	___%
b. opposed to the CBTE approach	___%	___%
c. neutral	___%	___%
d. unaware of the CBTE impetus	___%	___%

TABLE XXVI

MEAN PERCENTAGE OF UNIVERSITY OR COLLEGE PROFESSIONAL EDUCATION AND SUBJECT AREA FACULTY PERCEIVED AS COMMITTED, OPPOSED, NEUTRAL, AND UNAWARE OF CBTE

	COMMITTED		OPPOSED		NEUTRAL		UNAWARE	
	Prof. Ed.	Sub. Area	Prof. Ed.	Sub. Area	Prof. Ed.	Sub. Area	Prof. Ed.	Sub. Area
AETS	51.6	17.30	18.75	28.75	23.85	23.00	7.0	29.95
AACTE	48.79	7.35	12.11	11.00	21.55	21.91	6.38	31.67
ALL	49.83	11.03	14.56	17.57	22.40	22.31	6.60	31.03

27. In the space below please identify briefly three or four key problems that you are facing in CBTE efforts:

TABLE XXVII
FREQUENCY OF KEY
PROBLEMS IDENTIFIED IN
CBTE EFFORTS

Problem	No. of times mentioned by respondents
Lack of materials and resources	5
Lack of time for preparation and planning	10
Lack of research base	9
Defining and selecting competencies	13
Schedule conflicts	1
Changing from traditional to competency based	13
Problem of evaluation	5
Faculty spending too much time in schools	1
Management	1
Lack of expertise and need for retraining of staff	18
Need for smaller ratio of students/ teacher	1
Facilities	2
Faculty support	5
Integration of content with method	1
Need for greater contact with local schools	3
Certification	1
Student acceptance and adjustment	1
Development of legal consortium arrangement	1
Need for more personnel	1

DISCUSSION

Table I clearly indicates that CBTE relates primarily to the professional segment of the teacher education program. Over 90% of the programs reported involved the professional area whereas general education and subject matter areas were indicated by less than 15% of the respondents. Surprisingly, slightly over 30% of the respondents reported in-service education as having some competency-based elements.

Of the professional component, Table II indicates that the areas most commonly included are educational psychology, general and special methods and student teaching. All of these areas were reported by approximately 70% of the respondents.

The types of institutions reporting CBTE programs in this study (Table III) were predominately universities (73.3%) as compared to state colleges (17.3%) and liberal arts colleges (5.3%). This may be a reflection of the membership of AETS and the procedures by which AACTE identifies such programs. It is rather surprising that the larger institutions with their bureaucracies and inertia are apparently leading the way in CBTE programs. It would seem that smaller colleges, less inhibited with college and departmental barriers, would be better able to implement CBTE programs.

When programs are compared relative to numbers of students per semester involved (Table IV) it is apparent that most CBTE programs are small. Over 64% involve less than 150 students per semester. Approximately 45% work with less than 100 students per semester.

Table V indicates that the median range of student-faculty ratio

reported is in the area of 15-20 to 1. Sixteen per cent of the respondents reported a ratio in the range of 10-14 to 1.

When respondents were asked to indicate what proportion of their teacher education students were involved in CBTE (Table VI), a bimodal distribution was apparent with about 43% of the responding institutions reporting less than 20% of their students involved and nearly 40% (38.7%) reporting from 90-100% involvement. It would appear that institutions are either experimenting with CBTE or have decided to involve all or nearly all of their students.

Table VII shows that a relatively small proportion of the teacher education programs reported are competency based. Approximately 63% of the respondents reported less than 30% of their entire teacher education program as being competency based. This data is consistent with the responses reported in Table I which indicates that CBTE deals primarily with professional education comprising approximately 20% of the typical teacher education program.

Table VIII shows us that CBTE tends to be primarily a cooperative program of professional education departments and public schools. However, a surprisingly large proportion of institutions (44%) reported involvement with state departments of education. Approximately one-fourth of the respondents reported some degree of involvement with academic (subject matter) departments. In terms of control of CBTE programs, Table IX indicates that groups involved are education departments, public schools, students, state departments, academic departments, and professional organizations (listed in order of frequency

mentioned). It is particularly noteworthy that nearly half (48%) of the respondents indicated some degree of student involvement in the control of CBTE programs.

When asked if their programs operated within the framework of separate courses or merged courses, (Table X), slightly over half (52%) reported that some kind of block program existed. Thirty-six per cent noted they were still operating within a separate course arrangement. Twelve per cent of the respondents failed to respond to this item.

It is apparent from Table XI that the modular approach to instruction seems to be quite prevalent among CBTE programs with 84% reporting the use of this method. Congruent with the modular approach is the use of criterion referenced evaluation reported by 88% of the respondents in Table XII. Only 8% indicated they were using a norm referenced system.

When asked to indicate the types of procedures for measuring competency attainment, respondents reported the use of a variety of strategies (Table XIII) including paper and pencil tests, microteaching, student teaching, conferences, and pre-student teaching practicuum experiences, in that order of frequency. All methods were noted by more than 75% of the respondents.

Table XIV shows that participation by public school personnel in the operation of CBTE programs varies considerably, but involvement on advisory committees was most commonly mentioned by 76% of the respondents. Over 45% indicated that teachers participated on a "curriculum committee" and 37% reported joint appointments, which would seem to be a very desirable relationship.

When respondents were asked to indicate the presence or absence of pre-student teaching practicum experiences (Table XV), the vast majority (84%) noted they were using the public schools for this purpose. This experience appears at various stages in the preparation period (Table XVI), but was most commonly mentioned as a junior year experience (72%) followed by senior year (54%) sophomore (26.7%) and freshman (13.3%). (Since the practicuum is often available at more than one academic level, the percentages add to more than 100). In terms of time spend in the pre-student teaching practicuum, Table XVII shows that the most common range of time spent in the schools is 5-10 hours per week (33.3%) followed closely by less than 5 hrs. per week (28%). Only 20% of the respondents reported more than 10 hours per week.

Table XVIII shows that practically all (nearly 94%) of the respondents reported that they stated their competencies in terms of behavioral outcomes. This is not surprising since it is hard to conceive of a competency based program without behavioral objectives.

When asked to check the presence of selected characteristics of competency based programs, the frequency of responses in decreasing order were as follows (Table XIX): Evaluation consistent with both identified competencies and instructional strategies (84%), Competency statements shared with students (84%), Competencies stated as behavioral outcomes (80%), Focus on the learner as being responsible for acquiring competencies (76%), and Instructional strategies planned in terms of specified terminal competencies (74.7%).

Science Education Section

When asked to identify the nature of cooperative relationships existing between science and education faculties, the most frequently mentioned arrangement (Table XX) was cooperative discusssions to identify competencies (34.7%) followed closely by science departments providing learning experiences for achieving competencies (28%), integration of subject matter competencies with methodological and psychological competencies (28%) and providing practicum experiences in teaching (22.7%). One third of the respondents specified little or no cooperation.

Sources of science teacher competencies are reported in Table XXI. Apparently, in most cases (77.3%) a group identified as the "science education" faculty is involved. In nearly half of the cases (48%) public school staffs are consulted and in approximately one-fourth of the situations, the science staffs of the various institutions are involved.

The respondents were asked to assign a value to various categories of science teacher competencies. Of the 21 categories listed in the questionnaire the ten receiving the highest values in rank order were: the ability to plan; conduct and evaluate laboratory experiences; the ability to select content and materials in science; questionning skills; ability to use the inquiry method; the ability to individualize instruction in science; testing and evaluation skills; ability to write behavioral objectives in science; ability to conduct field experiences and

and utilize community resources, the ability to do long range (unit) planning and set (motivation) and closure skills. Table XXII displays the value and rank order assigned to each of the various categories.

Comparison of the values assigned to each of the categories by the AETS and AACTE groups shows some variance. For example, small groups leadership skills are considered more important by the AETS group whereas the ability to individualize instruction was rated higher by the AACTE group.

When asked to indicate how the science teaching competencies were presented, Table XXIII shows the respondents reported that 36% had integrated these skills with those involving the use of learning theory, 23% indicated some integration with subject matter skills and 20% reported them taught as separate skills. Over 50% indicated that they were using some combination of these procedures.

Table XXV relates the perceptions of the respondents relative to the proportions of professional education and subject area faculty who were competent in developing and implementing CBTE programs. The table shows that approximately one half of the professional education faculty and approximately 15% of the academic faculty were perceived as competent in this area.

The perceptions of respondents relative to faculty attitudes toward CBTE is reflected in Table XXVI. It is interesting to note that respondents reported about one-half of the professional education staffs as being committed, 15% opposed, 22% as neutral and only 7% as unaware. On the other hand academic faculty were reported as being approximately 11% committed, 18% opposed, 22% neutral and 31% unaware. These figures

are a reflection of the nature of the CBTE movement and its influence on the professional segment of teacher training.

When respondents were asked to cite three or four key problems in inplementing CBTE, a rather extensive list was identified (Table XXVII). The most commonly mentioned problems were: lack of expertise and need for retraining of staff (18), changing from traditional to competency based (13), defining and selecting competencies (13), lack of time for preparation and planning (10), lack of research base (9), evaluation problems (5), and lack of materials and resources (5).

Summary

It is possible to draw the following conclusions from the data described above:

1. Competency based teacher education appears yet to be in its infancy among teacher education institutions in the United States.

2. CBTE is primarily associated with the professional segment of the various programs as compared to the general education and academic portions of the programs.

3. The results of this study imply that CBTE programs are more commonly found in universities as opposed to state colleges and liberal arts colleges.

4. Relatively few students are being prepared in CBTE programs in relation to the total number of teachers in training throughout the United States.

5. Most CBTE programs are field based and public schools are heavily involved in the planning and implementation of CBTE programs.

6. Approximately half of the CBTE programs reported have merged two or more courses to develop their programs; nearly all are using some sort of modular approach to instruction and a criterion referenced evaluation system.

7. A variety of interactions are occurring between public schools and teacher training institutions, but participation on advisory committees is most common. Forty-five per cent of the respondents reported teachers were working on curricula committees and thirty-seven per cent reported joint appointments.

8. Some sort of pre-student teaching practicum experience was almost universally reported. It occurs predominately at the junior level or first semester of the senior year.

9. The skills valued most highly by respondents were those associated with individualizing instruction, laboratory and inquiry skills.

10. The most frequently mentioned problems identified in CBTE efforts were: lack of expertise and need for retraining of staff; the problem of changing from a traditional program to CBTE; defining and selecting competencies; evaluation; lack of a research base; lack of time for preparation and planning, lack of materials and resources; faculty support.

APPENDICES

COMPETENCY BASED TEACHER EDUCATION SURVEY

Directions: The purpose of this instrument is to obtain information about existing competency based teacher education programs. We define competency based programs as having a defined set of competencies or behavioral outcomes which have a range beyond a single course within the given institution. Performance goals are specified and agreed to in rigorous detail in advance of instruction. The student preparing to become a teacher must either be able to demonstrate his ability to promote desirable learning or exhibit behaviors known to promote it. He is held accountable, not for passing grades but for attaining a given level of competency in performing the essential tasks of teaching. We are interested in general information about your program as a whole and about the science education program in particular. The data collected will be reported at the Annual Convention of the Association for the Education of Teachers of Science and we will be glad to furnish you with a copy of the results. The questionnaire is designed to be answered in just a few minutes. Please place a check mark or marks by those responses that are appropriate. A blank space is provided following most questions for additional comments you may wish to make; additional comments may be inserted on a separate sheet of paper. Your cooperation will be deeply appreciated.

In addition to your response to this instrument, we would appreciate supportive information in the form of lists of competencies, sample materials, project descriptions, evaluation devices, etc. This information will enable us to ascertain the present status of CBTE programs in science education.

General Information Section

1. What segment(s) of the training of teachers is included in your competency based program?
   - ___a. Professional Component
   - ___b. General Education Component
   - ___c. Subject Matter Component
   - ___d. In-Service Component
   - ___e. Other (describe) _____

2. Of the professional component, which of the following areas are included?

	No. of Hours Credit
___a. History and/or Philosophy	___
___b. Educational Psychology	___
___c. General Methods	___
___d. Student Teaching	___
___e. Special Methods	___
___f. Other _____	___

3. What term best describes your institution?
   - ___a. University
   - ___b. State College
   - ___c. Liberal Arts College
   - ___d. Other (describe) _____

4. How many students per semester are involved in your competency based program?
   - ___a. Less than 50
   - ___b. 51-100
   - ___c. 101-150
   - ___d. 151-200
   - ___e. 201-250
   - ___f. 251-300
   - ___g. 300 and up

   Comment_____

5. In terms of full-time equivalents, what is your student/faculty ratio?
   - ___a. 10-14/1
   - ___b. 15-20/1
   - ___c. 21-25/1
   - ___d. 31-35/1

   Comment_____

Rank

___q. ability to conduct effective demonstrations ___

___r. ability to improvise equipment and facilities ___

___s. ability to conduct field experiences and utilize community resources ___

___t. ability to plan, conduct, and evaluate laboratory experiences ___

___u. ability to plan, conduct, and evaluate extracurricular activities in science ___

___v. Other (describe) _____

_____

_____

4. How are the science education competencies presented? (Check all appropriate)

___a. as separate skills

___b. integrated with skills in the use of learning theory

___c. integrated with subject matter competencies

___d. a combination of the above

5. Which of the following practicum opportunities are provided?

___a. tutoring

___b. leading small groups

___c. setting up labs

___d. clerical duties

___e. lecturing

___f. leading pre-lab discussions

___g. leading post-lab discussions

___h. preparing and using A.V. materials

___i. Other (describe) _____

_____

6. Approximately what percentage of the university or college faculty are themselves competent at this time in developing and implementing CBTE programs?

Professional Education faculty ___%

Subject Matter faculty ___%

Comment_____

_____

_____

7. What percentage of the university or college faculty are philosophically: (please estimate)

	Prof. ed. fac.	Sub. Mat. fac.
a. committed to the CBTE approach	___ %	___%
b. opposed to the CBTE approach	___%	___%
c. neutral	___%	___%
d. unaware of the CBTE impetus	___%	___%

Comment_____

_____

8. In the space below please identify briefly three or four key problems that you are facing in CBTE efforts:

9. In order to increase the value of this survey, we would appreciate the names and addresses of other individuals who might wish to participate in this study.

10. In order to receive a copy of the results of this survey, please provide the following information:

Name_____

Address_____

_____

_____

NOTE: Where additional space is needed please insert your comments on a separate sheet of paper. Please number the comment to correspond to the appropriate question. Please do not forget to send us a list of competency statements and/or samples of instructional materials.

APPENDIX B

Dear

An ad hoc committee of the Association for the Education of Teachers of Science (AETS) has been delegated the responsibility of conducting a status study of competency based teacher education programs in science. As a member of AETS, we are soliciting your help.

Your cooperation in filling out the enclosed questionnaire is essential to the success of this endeavor. It may be completed in about five minutes by checking appropriate responses and filling in a few blanks.

If you do not have a competency based program (as defined on the first page of the questionnaire), please write "no competency based program" on this letter or the questionnaire and return it in the enclosed postage paid envelope.

Please be assured that no mention of individuals or schools will be made in this study and that information you supply will not be used for evaluation purposes. All information provided will be held in strict confidence and will be lost in the mass of data collected.

If you are interested in receiving a summary of the results of this study, please indicate this on the final item of the questionnaire. It will be mailed to you as soon as the research is completed.

In addition to the data provided on the questionnaire, we would appreciate supportive information in the form of lists of competencies, sample materials, project descriptions, evaluation devices, etc. Your cooperation will be deeply appreciated and will enable us to complete our task.

Sincerely yours,

Donald W. McCurdy
Associate Professor (AETS - CBTE Committee Member

DWM/lma

Enclosure

APPENDIX C

Dear

An ad hoc committee of the Association for the Education of Teachers of Science (AETS) has been delegated the responsibility of conducting a status study of competency based teacher education programs in science. According to information received from the American Association of Colleges of Teacher Education (AACTE), your institution is operating some form of a competency based program. Thus, we need your help.

Your cooperation in filling out the enclosed questionnaire is essential to the success of this endeavor. It may be completed in about five minutes by checking appropriate responses and filling in a few blanks.

If you do not have a competency based rpogram (as defined on the first page of the questionnaire), please write "no competency based program" on this letter or the questionnaire and return it in the enclosed postage paid envelope.

Please be assured that no mention of individuals or schools will be made in this study and that information you supply will not be used for evaluation purposes. All information provided will be held in strict confidence and will be lost in the mass of data collected.

If you are interested in receiving a summary of the results of this study, please indicate this on the final item of the questionnaire. It will be mailed to your as soon as the research is completed.

In addition to the data provided on the questionnaire, we would appreciate supportive information in the form of lists of competencies, sample materials, project descriptions, evaluation devices, etc. Your cooperation will be deeply appreciated and will enable us to complete our task.

Sincerely yours,

Donald W. McCurdy
Associate Professor (AETS - CBTE Committee Member)

DWM/lma

Enclosure